

LISTING OF CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently Amended) A method of modifying a nucleic acid molecule ~~comprising~~comprising:
contacting the nucleic acid molecule with ~~[[a]]an isolated~~ prokaryotic DNA ~~repair~~-ligase polypeptide, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

2-4. (Canceled)

5. (Currently Amended) The method according to claim 1 wherein the nucleic acid molecule and the prokaryotic DNA ligase Mt-Lig-polypeptide are contacted in the presence of a prokaryotic Ku polypeptide, wherein the prokaryotic Ku polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08491 (SEQ ID NO: 92).

6. (Canceled)

7. (Canceled)

8. (Currently Amended) A method of ligating nucleic acid molecule ends comprising:
contacting a first nucleic acid end and a second nucleic acid end with ~~[[a]]an isolated~~ prokaryotic DNA ~~repair~~-ligase polypeptide,
wherein said first and said second nucleic acid ends are non-compatible-comprise non-complementary overhang regions, and

wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

9. (Canceled)

10. (Previously Presented) The method according to claim 8 wherein the first end is on a first nucleic acid molecule and the second end is on a second nucleic acid molecule.

11. (Previously Presented) The method according to claim 10 wherein the first and second nucleic acid molecules are DNA.

12. (Previously Presented) The method according to claim 10 wherein the first nucleic acid molecule is DNA and the second nucleic acid molecule is RNA.

13. (Previously Presented) The method according to claim 8 wherein the first and second ends are on the same nucleic acid molecule.

14. (Previously Presented) The method according to claim 8 further comprising isolating the ligated nucleic acid molecule, purifying the ligated nucleic acid molecule, or both isolating and purifying the ligated nucleic acid molecule.

15. (Withdrawn and Currently Amended) A method of labeling a nucleic acid molecule comprising:

contacting a nucleic acid molecule having a first terminus with an isolated prokaryotic DNA repair-ligase polypeptide in the presence of labelled nucleotides, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

16. (Withdrawn) The method according to claim 15 wherein the nucleotides are NTPs.

17. (Withdrawn) The method according to claim 15 wherein the nucleotides are dNTPs.

18. (Currently Amended) A method of filling in a single stranded gap in a double stranded nucleic acid molecule comprising:

contacting a double stranded nucleic acid molecule having a single stranded region with [[a]]an isolated-prokaryotic DNA repair-ligase polypeptide, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

19. (Previously Presented) The method according to claim 18 wherein said nucleic acid molecule and said prokaryotic DNA repair ligase polypeptide are contacted in the presence of NTPs.

20. (Previously Presented) The method according to claim 18 wherein said nucleic acid molecule and said prokaryotic DNA repair ligase polypeptide are contacted in the presence of dNTPs.

21. (Currently Amended) A method of removing a single stranded overhang from the end of a nucleic acid molecule comprising:

contacting said nucleic acid molecule with [[a]]an isolated prokaryotic DNA repair-ligase polypeptide, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

22. (Canceled)

23. (Previously Presented) The method according to claim 21 wherein said nucleic acid molecule is contacted in the presence of Mg^{2+} or Mn^{2+} .

24. (Withdrawn and Currently Amended) A method of producing an RNA molecule comprising:

contacting ~~[[a]]~~an isolated prokaryotic DNA repair-ligase polypeptide and a template DNA strand in the presence of NTPs, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

25. (Withdrawn and Currently Amended) The method according to claim 24 wherein the isolated prokaryotic DNA repair ligase and the template DNA are contacted in the presence of a primer oligonucleotide.

26. (Withdrawn and Currently Amended) A method of producing an DNA molecule comprising:

contacting ~~[[A]]~~an isolated prokaryotic DNA repair ligase polypeptide and a nucleic acid template in the presence of dNTPs and a primer oligonucleotide, wherein the prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

27. (Withdrawn) The method according to claim 26 wherein the nucleic acid template is an RNA template.

28-30. (Canceled)

31. (Currently Amended) The method according to claim 8 wherein the nucleic acid molecule and the prokaryotic DNA ligase ~~Mt-Lig~~ polypeptide are contacted in the presence of a prokaryotic Ku polypeptide, wherein the prokaryotic Ku polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08491 (SEQ ID NO: 92).

32-33. (Canceled)

34. (Withdrawn and Currently Amended) A kit comprising an isolated ~~Mt-Lig~~prokaryotic DNA ligase polypeptide for use in a method according to claim 1, wherein the

isolated prokaryotic DNA ligase polypeptide comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of accession number CAB08492 (SEQ ID NO: 91).

35. (Withdrawn and Currently Amended) The kit according to claim 34 comprising an isolated Mt-Ku polypeptide, wherein the prokaryotic Ku polypeptide comprises an amino acid sequence having at least 95% sequence identity with the amino acid sequence of accession number CAB08491 (SEQ ID NO: 92).

36. (Withdrawn) The kit according to claim 34 comprising dNTPs.

37. (Withdrawn) The kit according to claim 34 comprising NTPs.

38. (Withdrawn) The kit according to claim 34 comprising one or more of buffers, stabilisers and excipients.

39. (Withdrawn) A method of producing a prokaryotic DNA repair polypeptide comprising:

- (a) causing expression from a nucleic acid which encodes a prokaryotic DNA repair polypeptide in a suitable expression system to produce the polypeptide recombinantly; and,
- (b) testing the recombinantly produced polypeptide for prokaryotic DNA repair activity.

40. (Withdrawn) The method according to claim 39 wherein the recombinantly produced polypeptide is tested for one or more of: non-complementary end ligation activity, DNA dependent RNA primase activity, 3'-5' exonuclease activity, DNA and RNA dependent DNA polymerase activity, DNA dependent RNA polymerase activity, ATP dependent DNA and RNA ligase activity and DNA terminal transferase activity.

41. (Withdrawn) The method according to claim 39 wherein the prokaryotic DNA repair polypeptide is an Mt-Lig polypeptide or an allele or variant thereof.

42. (Withdrawn) The method according to claim 39 comprising purifying said recombinantly produced polypeptide.

43. (Withdrawn) The method according to claim 26 wherein the nucleic acid template is a DNA template.